PROCEEDINGS

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JOHN WILLIAM LUBBOCK, Esq., M.A., V.P. and Treasurer, in the Chair.

A paper was read, entitled, " On the Determination of the Terms in the disturbing Function of the fourth Order, as regards the Eccentricities and Inclinations which give rise to secular inequalities." By. J. W. Lubbock, Esq., V.P. and Treas. R.S.

The author observes, that the magnitude of the terms of the fourth order in the disturbing function, relating to the inclinations, in the theory of the secular inequalities of the planets, does not admit of being estimated *à priori*; and consequently the amount of error which may arise from neglecting them cannot be appreciated. The object of the present investigation is to ascertain the analytical expressions of these terms; and the method adopted for this purpose is derived from principles already explained by the author in a former paper. He has bestowed great pains in putting these expressions into the simplest form of which they are susceptible; and has finally succeeded, after much labour of reduction, in obtaining expressions of remarkable simplicity. He exemplifies their application by the calculation, on this method, of one of the terms given by Professor Airy as requisite for the determination of the inequality of Venus; and arrives, by this shorter process, at the same result. The same method, he remarks, is, with certain modifications, applicable to the developement of the disturbing function in terms of the true longitude.

A paper was also read, entitled " Note on the Astronomical Refractions." By James Ivory, Esq., K.H., M.A., F.R.S.

The object of this communication is to show how far the author has been successful in establishing the true theory of astronomical refractions, in his paper published in the Philosophical Transactions for 1823, by comparing the results of that theory with the best and most recent observations; namely, those recorded in the " Fundamenta Astronomiæ" of Bessel, and the " Tabulæ Regiomontanæ" of the same author. This comparison is made by taking the first and second differences of the series of the logarithms of the refractions in each table; from which it results that these differences, derived from the numbers in Bessel's tables, are very irregular; but that their mean very nearly coincides with that of the numbers given in the tables of the author.